

**FIFTEENTH DR. AMITABH CHOWDHURY ANNUAL
MEMORIAL LECTURE
THE CHALLENGE OF STRUCTURAL CHANGE IN INDIA
BY: MR.MONTEK SINGH AHLUWALIA
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Sri Jatin Hazarikaji, Chairman of the Trust, Mr. Justice Dhiresb Narayan Chowdhury, Mr. Justice Amitava Roy, friends, Ladies and Gentleman! First of all let me say that, it is a great privilege to be invited here to deliver the Lecture, in memory of someone who is no longer with us any more Dr. Amitabh Chowdhury, neither I had the chance of meeting. But I have read about from a booklet that was given to me- very touching description of a very unusual person, very talented and cruelly taken away at too early an age. So, not having met him but I am very pleased to be here, to be able to celebrate his life and say a few words as a part of this Lecture.

You know the subject that I have chosen, as you can see there, "*The Challenge of Structural Change in India*". Lot of the times, when I have given Lectures, the Lectures are all about you know, development and growth and so on, and you all are familiar with that field, and most of our political leaders, and we are all part parties and we will say that we need 8-10% growth. The good news is that, after the economic reforms, we got out of the slow growth period, and moved into a much better growth performance. We haven't got into 8-10% growth yet, on a sustained basis and I think it is no doubt that we need it, if you really want to develop, if this country is to become prosperous. Right now, we are in what is called the lower rate of the middle income group. We are not the poorest group, but we are in the lower rate of middle income group, and this is a big range and we ought to be trying very hard, maybe in the next fifteen years or so to get to the upper edge of this range. We still won't be developed, that requires much more in terms of growth rate. But you know, if you can grow in maybe eight plus percent, and if population is growing at 1 plus percent, then your per capita income is growing at about seven percent. So, the per capita income will then double, in ten years. Now, you know, even if it does that, from a base of two thousand dollars or so, not in PPP terms but in nominal terms; I mean it will grow up in ten years to four thousand and in another ten years to something like eight thousand. So, that twenty years, and that will put us roughly where China is now. That, gives you an idea of how far behind we are. But, the fact of the matter is that, it's possible. Now, when you look at it that way, everybody thinks about what you need for growth and most people have a fairly good idea. You need more investment, you need more infrastructure, you need better education etc. etc. But that's not what I am going to talk about, although that underlines what I am going to talk about.

What I am going to focus on, is with growth comes structural change, and also that structural change, is necessary for the growth to take place. This is actually a very important point because you know, any politician when he is addressing a large number of people, they don't actually talk of structural change. They say, I am going to give you growth, so that everybody will be doing whatever they are doing. Except growth, there is hypothec future. That doesn't actually happen. I mean leaving an example of what Structural change means? And then I will give one example and talk of other cases. You know, the simplest example is to look at what Structural change would mean for Agriculture? Because, as I said, if we manage to get a GDP to grow at eight plus percent. It is now growing at seven plus percent. With a little bit of luck, we can get to eight plus percent, and then population at one plus percent, per capita income seven, income will double in ten years. But, you know the demand for food and such Agricultural products will not double. That's what Economists mean, when they say income elasticity or demand of Agricultural products is less than one, which means that if income goes up by thirty percent, the demand for Agricultural product will only go up by only ten percent not thirty percent. So, the total demand of Agricultural output is likely to fall short of the total growth of output in the economy. In the last maybe fifteen twenty years, Agricultural growth has not exceeded three percent on an average, although the economy has grown somewhere around six and a half, seven percent. What does this mean? What this means is that, whereas Agriculture today accounts for eighteen percent or so of our GDP if we get the growth we want, then in maybe another ten years, Agriculture will only account for twelve and a half percent of our GDP and twenty years it will be even less. The structural change is not just of the production. I mean if that is all, we will say fine. So, we will use less Agricultural products, we will use more other things. But you have to look associated with that is how much of our labour force is currently occupied in Agriculture and you will find that the labour force occupied in Agriculture is but 49%. So, 49% of the labour force is producing 18 percent GDP. That's why Agricultural income per head is much less than income per head in the rest of the society. Now, obviously you want income per head in Agriculture also to increase. Probably you will say, you know many people will say, we should close the gap, between income per head in Agriculture and income per head in the rest of the economy. But, atleast people would say, they should not diverge further. So, let's look at what that implies. If for the economy as a whole, you are getting a growth rate of eight and a half percent or so, and a population growth of one and a half percent then you are getting a productivity growth per percent of about seven percent, per year. But you know the Agricultural side, even if we achieve our targets, and our targets were four percent growth in Agriculture, I have already said that on the demand side, there won't be demand for more than that, and actually we have not even achieved the targets for the last several years. Now let's say if

we have achieved the target and agriculture can grow at four percent per year. You know, if output is growing at four percent per year and you want productivity to grow at seven percent per year. This is only possible if employment actually falls. For example, if employment were to fall three percent per year in Agriculture, output grows at four percent per year, then the productivity growth per year will be around seven percent. But, consider the implication of that over a ten year period. What it means is that, over a ten year period, your employment in Agriculture might be thirty percent lower, then, it is today; because it is going to go down at three percent every year. Now that has lot of implications, because you know what is going to happen to the people who are currently employed in Agriculture. I mean the logic is that, these people would move out of Agriculture, not necessarily out of rural areas. Some of them, would stay in the rural areas, but get absorbed in Non-Agricultural activity in rural areas. After all, if Agricultural incomes are growing up, there will be demand for other products, repairs, etc. etc. But, certainly a substantial number of them will move to urban areas. That's another structural change. As, just part of the basic arithmetic, we ought to be able to be thinking of a structural change, in which much more employment is created outside Agriculture, employment has actually reduced in Agriculture. Very few politicians by the way are willing to accept this. Most of them would say that, employment should be increased in Agriculture. It sounds good. But, actually if we work it out, you need to take people out of Agriculture, and that is what would increase the income of those who remain behind in Agriculture. For that, you have to move them into towns; you have to give them jobs. So, you have two challenges to address, and those are challenges relating to structural change. You need to create jobs in urban areas, and you need to create jobs in Non- Agriculture. All right, this is...the emphasis here is the fact- structural change. Within Agriculture, there is lot of structural change also that is taking place within Agriculture. I mean, for example, in most people minds, Agriculture is associated with food grains. Certainly from where I come, Punjab, Haryana, they all think of Agriculture as food grains. But actually the importance of food grains in Agriculture is declining. I mean the value of food grain output, as a share of total Agricultural output is falling; and what is increasing is the value of milk, and Dairy generally and poultry and horticulture. So, you need to think of Agriculture also going through a structural change. What is the implication of that? I think the implication, the moment you think about it as structural change; you realize the name of the game is not repeating the same old things, as I used to talk about it earlier for example. When food grain production was a big thing, what succeeded then, was a publicly funded research, which of course gave high yielding crops and minimum support prize, which gave the farmer an assurance, that if you take your grain to the Mandi and there will be a price. Now, you know, this is not at all workable. When Agriculture diversifies into perishable horticultural crops, you can't just sort of

harvest the crop and take it, to the Mandi in whatever way you like if it's a perishable crop; it needs to be moved quickly and preferably in a refrigerated manner or in a cool manner and so on. And, secondly it is quite useless having the concept of minimum support price. Because, you know there are tomatoes that look nice, tomatoes that don't look nice. Each one of them, you get at different price. The whole pricing of the marketing of perishable crops requires a completely different market structure. Not, what you have for rice and food grains. So, that's another example of structural change; and what that brings in, is that the role of the private sector. You know, the idea that, the public sector, will buy vegetables and so on, just does not make any sense at all. We are not yet faced up to that fact. Central Government for several years have been saying, present Government has also been saying, that you know, we should just get rid of the Agricultural produce, Marketing Committee Acts, which create a monopoly in the sense that, the only place where you can buy a produce is in the Mandi, and in the Mandi the only people who are trained are licensed traders; and that's a sort of a closed Network, with very non-transparent ways of determining prices. So, Farmers just give their produce to an Agent, who takes it to the Mandi, and then the produce is sold in a non-transparent way, and he doesnot really know what's the price, and the guy says, that morning, this was the price of the vegetable and that's it. So, there is a huge round of exploitation and every one of you have heard that, Farmers get a fraction of what the consumers get. Now, if you look at, what is the price of tomatoes in a retail market, and you get the price othat the farmer gets, the difference is huge. Now, how do you overcome that? Not in my view, by State Government, getting into the act, the way they do with food grains, but really by having a much more modern system of marketing of vegetable crop. Along with that, you have logistics and good chain and warehouses, etc.etc. etc. So, here the structural change- if we know that the structure has changed, then we can work out the way of addressing that problem. You know, at the moment, there is a lot of talk, for example E-marketing- very good idea. But, you know, the E-market doesn't actually serve much purpose, unless, it is associated with reliable grading. I mean, the theory of an E-market is- if I am sitting in Delhi, and I want to buy something from the E-market in Guwahati, I should be able to look at it and see what the prices of vegetables is and buy them. But, that really makes sense, if there is good grading, if after I brought it, it won't deteriorate in transport. The logistics companies were I think could tell people, I am buying this from here, you please pick it up, Bhindi of a particular grade and bring it over, and within one day or two day tell up, that I wanted to turn up. That requires a whole new ecosystem, and we need to develop that ecosystem, if you are going to be able to move; if we are going to accommodate the Structural change, that is taking place in Agriculture. So, in the same way, I think some of the other structural changes that we have to look at- I mean the list of things that I want to talk about, I don't want to spend too much time on this, so I am

going to talk about briefly, and I don't know, if there is room for; time for some questions, we can have a few questions also. But, let me give you, for example, six points, that I want to touch upon. The first point, relates to Urbanisation- which I have mentioned; second point relates to educational skills, which I think I have also mentioned; the third point relates to technology and employment- what it's going to do? The fourth point relates to the role of small and medium industry; the fifth point relates to financial inclusion and technology change, and what that is doing. Finally, I want to say on climate change and how that might impact us.

So, going back to this list- the idea in each case is that, these are things that, they all need to be approached in a framework; in which we recognize that, the structure is changing, and then we have to work out a way of doing, what is necessary to facilitate the structural change; and the particular thing that you have to do is- now first urbanization. You know, in India, historically have been slow to urbanise; and many of our political leaders in the past, didn't think much of Urbanisation. I mean, they used to feel that, India in terms of the villages, and that's what it should be and preserve the rural way of life. Of course, you know, that was quite legitimate, credible way, while we were low income country economically and that's all. But, every country, as it has developed has urbanized. Today, in India, about thirty one (31%) percent of our population lives in urban areas. If we think of becoming twice and four times, the present income level, and we compare with other countries, we need to allow for something in the order of fifty five (55%) percent, if not more, of the population becoming urban, and that's what is going to happen in twenty years time. You know, that is a huge, really huge structural change. Two things follow from that. One- this shift, is not going to mean an expansion of the existing Metro cities. They are already too large; and if you go anywhere in the world, it says that you know, Mumbai is 19 million, Delhi is 19 million, those are size of countries in the United Nations. So, it is quite clear, that we are going to have a process of urbanization. That, process of urbanization, is going to be big expansion, in what are today called the non-Metro towns- to mean the large cities or even the second tier cities. You know, very little thinking has gone into- what is the scope for improving Urban services, in these smaller towns. The present position is that we are not even able to achieve improvement in Urban services, in the Metro towns. So, how much thinking are we doing? Will we be able to have these smaller towns, second level cities, grow and absorb the people, with the right amount of economic services? So, the critical thing here, is that city development, cannot take place. Will we be able to have these smaller towns, through a top down system? The second level cities grow where the State Government provides money for the cities. That never happens. State Government at the most bothers about the State capital. So, it is kind of generally regarded everywhere that we need to empower the cities, and I think we have not done that. The Constitution actually, the 73rd

and the 74th Amendment, did say that we must empower the Panchayati Raj lower level bodies. But, in reality nothing has happened. So, this means we need a bit of thinking on how are we going to ensure that our cities have the power ; city governments have the power to actually organize them in a way, in which they can become economically compatible providing the kind of services you need if you are going to have a competitive economy. You know, I will go back to when I was in the late 1980's. I was part of the delegation, then Prime Minister Rajiv Gandhi led on his visit to China late 88. And, I was quite struck by the fact, when he first arrived in Sanghai the Programme said, that the Prime Minister will be given a dinner, by the Mayor of Sanghai. You know, Indian protocol wise, Mayors do not figure high enough. They do there. I said, how come we are doing this? Then, I was told, you know, Sanghai is like a province. It is not just a city. And in any case, the person who was going to host the Prime Minister, was most likely to become the Prime Minister himself ten years later; which he did. Now, you know, in China, political leaders are trained by making them Mayors of important cities and then seeing how they perform. That doesn't there; no important leader in India wants to become the head of the city. Nor does the State Government organize itself in that manner. So, I think, this is a big question- do we think, that we will be able to have cities that deliver good governance, without a very fundamental change in how the cities work within the governance structure of the country, including devaluation and having the ability to tax etc. etc. And I think this is a very particular thing. Most people abroad, when they look at Indian cities will tell you, that our cities simply do not have the power to do what is needed in order to make it a good city. All powers are with the State Government, and very little is actually delegated down. So, that has to change. Now, underlying that, is a completely different area and that is the area of electoral representation; because we have frozen the representation one of them at one of the 1971 population level at one point, then we changed it. The percentages of urban seats or the number of- the percentages of seats in the Lok Sabha that represent the Constituencies is much less, than the actual urban population. So, the cities don't have the same amount of vote in the National Parliament; and I am sure that, in the State Legislatures they also don't. So, those are examples of the Structural change, which are related to the problem of Urbanisation.

Let's look at Education and Skills. You know, when we talk about growth, everybody says, you need human capital. We need good education, we need skills; and if you read the Newspapers, you frequently hear, that the Industry people say that, we are turning out students from Universities, but the students are not sufficiently trained with directly employable in Indian Industries. The basic human resource material, is actually quite good, and infact with a three, four months training programme, they manage to do quite well. But, they are not actually being given functional skills. Worst example of that,

of course are our schools. Every year, you have the annual survey of education in rural India, the ASARD survey, and that actually brings out, you know, 50% of our students, in let us say, Class IV or V, cannot read a text, that is meant to be read at Class II. So, you know, if the educational system is non performing to that extent, you can imagine what happens, that if 50% of the kids are not able to read the textbook, then essentially what is happening is that, they are being promoted automatically, to higher and higher classes. So, they keep going to higher and higher classes, they progressively lose interests. Teachers also, are not in a position to teach them properly. So, the teachers also concentrate on the top 10% of the students. So, we are producing large number of students who don't have functional literacy and don't have functional numeracy. Now, in a world, where we are expecting to move labour from rural areas to urban areas, and I will come separately to the technology trends, this is a huge challenge. Are we able to actually re-deploy, restructure the education system, so that it produces the kind of people, the kind of skills that are now needed, in order to provide jobs. And, you know, educational reform is extremely difficult, I mean. In the UPA times, when I was in the Planning Commission, we concentrated on the Right to Education Act, etc. so there was a realization, that this is very important, and more money was also spent. But, the problem wasn't more money. I mean, we did increase the schools; we did increase the enrolment rate. The enrolment rates in India, and primary education in India, are high nineties. But, the problem really is, that half the kids are not actually learning, what they actually should be learning. So, this is a huge huge challenge and it is not the challenge that the Central Government can do anything about it. This is entirely the State Government matter. So, here is an area, where if we have these admissions and high growth rate; we must have an answer to the schooling side. How are we going to take care of developing kids with capacities needed to fill into the labour market? Now, let me touch on the third point that I talked about. That's the whole question of what's happening to technology around the world, and its impact on employment. You know, I said in the beginning, that in order to cope with these kind of structural change, we need to create a lot of non-Agricultural employment, because we have to take people off Agriculture. But, living in a world really where on the technology front, all the development that are taking place are reducing the need for jobs in certain areas. Certainly in manufacturing, large manufacturing labour intensity is going down; and it is being driven to some extent by technology. You know, the impact of technology here is quite important, because as you walk into the global value chain; if you are made part of the global value chain, that will also dictate the technology you use. You won't be eligible for getting into that chain, if you are not technologically upto the mark; and unfortunately all the technologies that are being developed are being developed for the Western world; and there they want to avoid hiring too many people. So, this is the move away, from labour employment, at certain

ranges of the technology. There are other technologies that are being developed, which are actually going to make certain jobs irrelevant. This is not just an Indian phenomenon. This is true globally. I mean, I think many studies have been done which say that, within ten years, the numbers vary, but they say that 35% of the jobs that currently are there, would be needed. This is scaring large number of people. Because, this is a big, what I call a Structural change, is a bit of a shock also. Now, it's not, it's not that jobs will be destroyed, as historically, as often happen, when new technology comes in, some jobs are destroyed and new jobs are created. I mean the best example of that, is all the Uber cars. Do you have Uber in Guwahati yet? Ok! You do. So, you know, when Uber came in, local taxis felt deeply threatened understandably. Not, just here, all over the world. On the other hand, the Uber technology allows much more flexible work organization. People who only have three hours to spend in a job, particularly for example Women who have other obligations, which they don't want to give up, they have three four hours trip can become drivers of Uber cars and switch off when they don't want to work. Completely new kinds of jobs are created and existing jobs are under threat. You can multiply these in many many areas. One of the issues here would be the initial reaction to these technologies bringing in these new jobs will be anti. Good example of that, is what happened with search pricing, in these Uber times, platforms. That is when there is too much demand, the price goes up. Ah, and from purely economic point of view, that's not irrational. If the price for ride goes up, many people who were offering their services come in, and when it's a low demand, they go out. So, in a way, it serves the purpose of equating demand and supply. But, there was a lot of objection to search pricing, because of the fact, it is exploited. But, people actually wanting the ride, was saying no, no this is wrong, shouldn't be allowed to raise the price etc. So, there is lack of full understanding, different points of view, but the bottom line is that, I don't think it is going to be easy for us, to be hitting eight percent (8%) growth, unless we are willing to make these structural change. So, for example, in the case of jobs for young people, all over the world, also I think in India, Companies are no longer thinking of long term hires. They hire people, and they let them go. This is what they call Gig economy. Don't know how the word gig came up. Now, one view is, in the West, this just allows flexibility, in moving to the labour market and moving out of the labour market. But, many other people have rightly pointed out, it creates an enormous insecurity. Cause, you cannot now say, that I have a job, with a high probability, that you are going to be permanently employed. Then, you can start planning your life, you know, taking a loan, to buy a house, or buy a car or something like that. In the West, this shift is causing social tension. Ofcourse, the answer people say is that, look if this is the way to go, then the State must put some social security to flow under everybody; and they haven't done that yet. So, we need to look at, how are our Society is going to change, with this sort of new approach to employment,

and what is that we can do, within our own limitations. So, I think this is another example, where we have to recognize that all solutions are going to work, so that we find some new solutions that can address these problems. I mean, another example, all the time, is online purchases, that take place. Ahh, the rise of online transaction really mean, that you know, you don't have to visit your Bank very often. In our case, we have Public sector Banks that are hopelessly overstuffed. I mean the difference if you like, per hundred rupees, and hundred thousand rupees per transaction. Public sector Banks, have four times the employees as Private sector Banks do. So, my point is that you know, if Banks are forced to become more efficient, which they have to be, then basically they may not fire anybody for quite some time. But, then you know they won't be hiring people either; they may have excess staff, except in very specialized areas. So, we will see the effect of that, in the next ten years, in much less growth of employment, in the traditional areas, which are the sources of white collar employment. That's already happened in the Public sector for quite some time; probably likely to happen in the case of Banks also. So, we need to look at the new jobs that are being created and that's where all over the World, and in India too, lot of emphasis is being placed on Staffs'; encouraging young people to start their own business; and lot of that will be happening. But you know one of the things in the startup is that, while it also hires people, it doesn't hire them on a long term basis. It also hires them, on a much more short term basis. So, everybody has to be used to the fact, that new jobs are being created, there would be very different jobs from the ones that our people have been traditionally used to. So, that is something that requires some adjustment. If the answer lies in many many more startups, then we have to look at, what is the ecology that will encourage and support startups. And, the biggest thing there is, the ease of doing business; simplicity; people can come in and walk out of business. They shouldn't be here with for the close of business, and without too many problems etc.etc. But, you know, the rules and the laws we have got, do not allow people to close businesses very easily. So, what this will do, discourage new startups, from coming and while some jobs are being lost, not enough new jobs are being created. This is another area, where we need to have very focused attention. You know, there is a lot of talk about small scale industries, small and medium enterprises. Again, all over the world, these are the enterprises that actually produce jobs in large numbers. Big enterprises are capital intensive and the technology that they are using is infact reducing the number of jobs than they do. Small enterprises are more capital intensive and they are producing more jobs. But, you know the difference is that, in India, we have a very lopsided sort of system, where our small and medium are really dominated by tiny enterprises. So, when we say small and medium, there have to be small and medium enterprises that can produce products that are actually sufficiently modern, to be fitting into a more modern economy. So, the enterprise small in the sense that it is not an

enterprise of two and three and four people; but it is an enterprise that has maybe one hundred and five hundred people; and we don't have enough of these. Most of us old industries are very tiny workshops which by and large are able to produce products, which can competitively be fitted into a modern industry. Take automotive components for example, as we upgrade the quality of our automobiles, the quality of the components of the automobiles, goes up very substantially. And the fellows who are producing components, for bicycles fifteen years ago, with a certain type of technology, they cannot actually manufacture components that will be necessary for automobiles. Again, a big structural change will have to take place. And, you know, linked to that is the whole issue of formalization of the economy. I think one of the big problems in the last several years, is that while employment has been created, according to the data, lot of it are contractual and informal. Even in the private sector, where it has expanded, they have not actually expanded formal employment; they have expanded employment on contractual basis. I think the Government has made some changes in the law, that will facilitate expansion of contractual employment, and that's probably a good sign. But, you know, we have to recognize that the nature of jobs therefore is going to be quite different, in years ahead; and I think, this is something that young people- it's a mental attitude, young people can be very flexible, they can be persuaded to do different things, but in India, I think Parents are all the time telling them, you must go for a permanent job. Now, they have their own mind, but I think we should recognize that, it's a world in which they are going to have to experiment. I always tell the younger people when I meet them that, my generation where most of the people that graduated around the time I did, had the expectation that, they would be in one job, pretty much for the rest of their lives. This new generation, will be changing jobs all the time. You know, I find when I talk to students, they are actually quite happy doing that. But, their parents are utterly miserable. So, frankly this is one of things, that Parents need to understand, that the world has changed and not put unnecessary pressure on their kids, preventing them from adjusting to the kind of world that now exists. Linked to this is the other area of change I talked about, which is financial inclusion. Now, there you really see a tremendous change, in the underlying technology. I mean, you will see a move away from cash transaction gradually. I don't think that it should be pushed, but will happen automatically, and the moment you see that, it will also formalize the economy, because if you are not into cash transaction, then you are going to be subjected to more tax scrutiny, which is a good thing. So, overtime, this will be a very substantial change. But you know, in this change, I have recognized one thing, not all small enterprises will formalize without trouble. Many of them, their economics depend, on not having to pay the tax. I mean, they are not economically viable, if they pay the same tax, four percent (4%) or so. So, you know, soon one way or the other, you will see another structural change. It is not that all the informal sector

enterprises will survive and flourish. Some of them will maybe become formal and maybe become three and four times larger, they will still be quite small, and as a result, the other ones will get squeezed out, and the people who are working in those will have to find jobs, in the economies, in the enterprises that are expanding. Again, a traumatic development, but still a structural change, and somehow we have to adjust to that. And, I mentioned earlier, that the problem of Banking. You know, I find it amazing, I am sure that is true in Guwahati also. You know, within the same building, you will have three branches of Public sector Banks, which is completely unnecessary, in the sense that, in the old days this was necessary because, if you wanted cash or cheques to deposit, you needed all those Tellers. But, you know, with ATM's and so on, you don't. So, this is an area where technology is likely to have quite a big impact, probably within the next ten years or so. Finally, let me just talk a bit on climate change, because that is another issue that is facing the whole world. And you know, it will face us more than other country. India is in the geographical geo climatic range, where it will be one of the more heavily affected countries by climate change. We don't have an International Agreement, and indeed the United States, has backed off from the Paris Accord, although they are the biggest inhibitor so far, maybe the second biggest after China. But, you know, let us assume, somehow or the other, at some point, the US will also come on board and today we are participating in climate change talks and quite happy about it and saying that, there is a kind of International Agreement, where every country to moderate its own carbon emissions. This is actually quite a big achievement in one sense, because you know, few years ago, the developing countries were taking the position, that listen, we haven't caused this problem. It is you fellows that have expanded so rapidly. You are the ones that have got put all the CO₂ into the Atmosphere. So, you should do something yourself and don't just expect us to do anything. That's change, and we are saying, look we also have the responsibility. And all countries, except the US have now laid down, some kind of country commitment, on how much reduction or emissions are we going to do. But, you know, the bad news is that, even if all the countries, achieve what they had promised to do, it is about what is needed in order to avoid drastic climate change. I mean, if you really want to keep the rise in temperature, about 1 ½ to 2 degrees above the industrial levels, you have to go to zero carbon emissions; zero by 2050. We are nowhere near that. All that is happening, is that, the growth of carbon emissions, have slowed down. Getting to zero is a very very distant prospect. So, one way or the other, since we are going to be badly affected, in one way or the other; we expect that you know, somehow we will also be able to participate in some global agreement, that will limit the impact of climate change. One of the consequences, by the way of climate change, is highly unpredictable precipitations, which can lead to much more floods than normal. We are right now within a couple of kilometers of the Brahmaputra; which is known to do a

lot of flooding. So, unless this climate change thing is brought under control, that problem will only get worse, and that will have lot of impact on people's lives and livelihood as so on. So, it is not something that is beginning. No! But how do we do it? You know, there are only two things that will actually bring about a significant impact. One, there is a shift to green energy, which means much less, slowly getting away to coal. Now, you know, we have said we need energy, Solar, Wind and so on. But, we have not actually set targets for, how much reduction of dependence on coal, are we planning. And probably, we need to do that. One consequence of that, will be, Ah! The price of electricity will go up; and the other side what you have to do for climate change is that, promote energy efficiency, which means, you produce the GDP you do, but with much less energy. Now, you know, any economist will tell you, if you want to economize on something, then you raise the price of that. If you don't raise the price, there is no reason why anyone should economize. So, what we need to do is to put lot more taxes on energy, particularly fossil fuel energy; and the resources we gain from that, can be used to finance all the green energy. Otherwise those resources will be an additional tax. I mean, we have opened a little chink in the door, because we did introduce a clean energy cess on gold. It was down in the last two years of the UPA at a very small level fifty rupees a ton. The present Government has increased it significantly to two hundred rupees a ton. But, you know, if you really want, to neutralize the negative effect of fossil fuels; this tax has to be increased to three thousand rupees per ton. That is certainly going to include a big increase in electricity, if you raise it how you will run. But it is one of the structural changes that, we will have to face. So, I won't go on and on. What I have been trying to sort of say is that, very often these debates are conducted in terms of what is needed, as a policy. And you know, the policy looks good, people say that's fine it doesn't need change, and so on. But, we have to recognize, that underlying these recommendations, is the recognition that we are trying to cope with or encourage certain kinds of structural change. And those are very big change. So, if you want to encourage those then, some of the action that you have to take correspondingly will be more difficult. And so, with those words, thank you very much for inviting me and listening to me. If there are any questions, I will be very happy to give. Thank you!
